

Response of Riparian Vegetation, Instream Habitat, and Aquatic Biota to Riparian Grazing Exclosures

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Improper riparian grazing can alter riparian vegetation and reduce streambank stability, negatively impacting aquatic habitat and biota. We evaluated differences in riparian and instream habitat, benthic macroinvertebrates, and fish inside versus outside seven riparian exclosures constructed from 1982 to 2005 in the Goose Creek Basin of south-central Idaho.

A satellite-derived measure of vegetation showed significant increases in riparian productivity after some but not all exclosures were constructed. Field data collected in 2015 showed woody riparian vegetation to be more abundant, streambanks less altered, and stream channels narrower inside versus outside exclosures, as we expected. However, instream habitat, a benthic macroinvertebrate index, fish species richness, and adult salmonid density showed no response. Higher age-0 salmonid densities were the only aquatic organism response observed.

Broader watershed-scale factors likely limited strong and consistent responses by aquatic biota to exclosures. We conclude that riparian exclosures have localized effects on stream systems, such as increased riparian vegetation, reduced streambank alteration, and improved channel stability, but may not always influence aquatic biota that commonly reflect larger watershed-scale processes and conditions.

Therefore, well-maintained riparian exclosures should be used to eliminate livestock use in localized areas of stream corridors that are sensitive to disturbance. To improve stream health at the larger watershed scale that is relevant to most aquatic biota, exclosures should only be one of several grazing management tools implemented simultaneously to reduce the impacts of improper livestock grazing.